

Fenugreek Extract (*Trigonella foenum-graecum*)

Introduction

Fenugreek is a species of plant in the Fabaceae family, where we get legumes like soybeans and peanuts from. Also known as *Trigonella foenum-graecum*, this seed extract is typically native to southern Europe and the Mediterranean region but is also grown in northern Africa and western Asia. The leaves and seeds of fenugreek are commonly used for flavourings and a spice in curries due to their strong aroma and flavour (1). Fenugreek is considered as one of the oldest plants used traditionally in Chinese medicine because of its health-promoting effects (2). This botanical plant is known as a galactagogue and therefore is used during lactation for breast milk production and supply (3). This is in addition to possessing other potential clinical uses such as cholesterol and blood glucose level regulation. Fenugreek can be used in application for both male and female specific ailments too.

Clinical uses

CHOLESTEROL

A systematic review and meta-analysis of randomized controlled trials investigated the effect of fenugreek supplementation on blood lipids and weight loss. This involved 12 randomized controlled trials with 560 participants. The results showed a significant decrease in plasma concentration of total cholesterol with fenugreek supplementation, with triglycerides and low-density lipoprotein cholesterol decreasing and an increase in plasma high density lipoprotein cholesterol. Therefore, it was concluded that fenugreek supplementation improved lipid parameters in adults (4).

In another study, the authors investigated the antidiabetic effect of fenugreek seed on hyperlipidemia in diabetic patients. This study involved 114 participants consuming either metformin in the control group or 25g of fenugreek seed powder orally twice daily for one month in the treatment group. The results, as shown in figure 1 and figure 2, displayed a clear significant difference between the treatment group and the control group outcomes of fenugreek supplementation effects on blood lipid levels. The results also showed that in the treatment group, there was a significant reduction in total cholesterol and triglyceride levels (5).

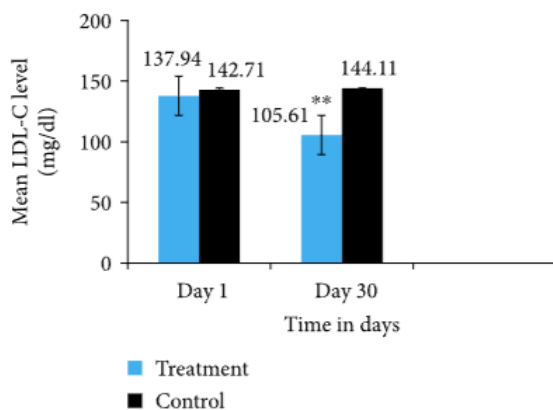


Figure 1.

Figure 1. LDL-C level of the treatment and control groups on day 1 and day 30.

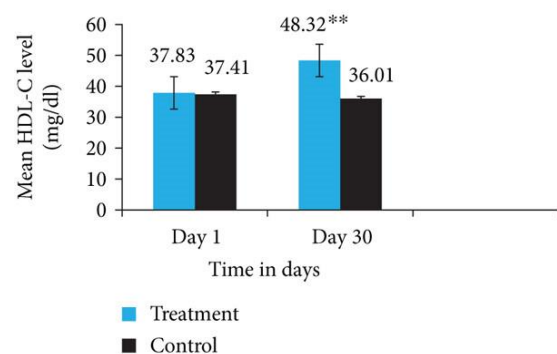


Figure 2.

Figure 2. HDL-C level of the treatment and control groups on day 1 and day 30.

TESTOSTERONE

Fenugreek is well-known for improving sexual function as well as testosterone. The bioactive in fenugreek are known as saponins, which have been shown to be particularly beneficial for testosterone production. One randomized, double-blind trial, included 30 resistance-trained men that were given either 500mg of fenugreek seed extract, containing 50% fenuside saponins or placebo. The strength and hormone measures of these athletes were measured at baseline, 4 weeks and 8 weeks. The results showed a reduction in body fat and increased testosterone in the active fenugreek seed group (6).

In a double-blind, randomised clinical study, the effect of fenugreek seed extract was measured in enhancing testosterone levels and improving sperm profile in male volunteers. This involved 120 healthy men aged 43 to 70 years old being given 600mg a day of fenugreek supplementation. The primary outcome measure was the change in Aging Male Symptom Questionnaire (AMS), measures of sexual function and serum testosterone. The results showed a significant decrease in AMS score in the fenugreek group. Both serum testosterone and free testosterone increased in the active group compared to placebo, along with an improvement in sexual function (7).

In an open-label, one-arm, single-centre longitudinal study, a fenugreek seed extract supplement which was fortified with furostanolic saponins was investigated for its effectiveness on boosting testosterone levels, reproductive health, and mood alleviation in male volunteers. 500mg a day was given to 100 healthy volunteers for a period of 12 consecutive weeks. Their total testosterone levels, sperm count, and other sexual health parameters were examined. The results showed this supplement was safe and effective in significantly improving testosterone levels and other sexual health parameters in healthy male volunteers (8).

BLOOD SUGAR REGULATION

Fenugreek contains the bioactive furostanolic saponins, which are known to be anti-diabetic. One double-blind, placebo-controlled study investigated the efficacy of fenugreek seed extract in type II diabetes. This involved the patients with type II diabetes being given a 500mg fenugreek seed extract supplement twice daily. The results of this study showed that there was a significant decrease in fasting glucose and serum insulin levels (9). A meta-analysis of fenugreek's effect on hyperglycemia and hyperlipidemia in diabetes and prediabetes also found that fenugreek shows potential in lowering total cholesterol and also has hypoglycaemic effects in both diabetes and prediabetes (10).

In another randomized, placebo-controlled, double-blind study the authors aimed to determine the efficacy of fenugreek seed extract over a period of 90 consecutive days. This involved 154 subjects, 108 male and 46 females being given either 500mg/day of fenugreek extract or placebo. The fenugreek extract supplement resulted in a significant reduction in both fasting plasma and post-prandial blood sugar levels. Approximately 83% of subjects reported decreases in fasting plasma sugar levels. With 48.8% of subject reporting reduced dosage of anti-diabetic therapy in the fenugreek group, whereas just 18.05% reported reduced dosage of anti-diabetic therapy in the placebo group. Therefore, it was concluded that fenugreek seed extract is safe and effective in ameliorating type II diabetes symptoms in humans (11).

Hyperglycemia is a condition which is characterised as elevated blood sugar levels. The effect of fenugreek on hyperglycemia was investigated in a systematic review and meta-analysis of 14 trials involving 894 participants. The results of fenugreek consumption showed a reduction in fasting blood glucose levels. The overall findings were that there were beneficial effects of fenugreek on glycemic control (12).

One randomized double-blind, placebo-controlled trial studied the efficacy and safety of fenugreek seed extract in early glucose dysregulation. 54 participants were randomized to receive either 500mg of fenugreek seed extract or placebo daily for 12 weeks. By the week 12, there was a significant difference seen in fasting blood glucose levels and triglycerides in the fenugreek group compared to placebo. Highlighting that fenugreek seed extract may influence blood glucose metabolism (13).

BREAST MILK PRODUCTION

Fenugreek is a galactagogue which is commonly used by lactating mothers. One study aimed to investigate the effect of fenugreek on breast milk production and weight gain among infants in the first week of life. The mothers in the experimental group were administered 7.5g of fenugreek once daily, for the period of 7 days. The overall result of this study demonstrates that fenugreek was effective in enhancing breast milk production and therefore increased the weight of infants, particularly in the early days of life ⁽¹⁴⁾.

A systematic review meta-analysis also investigated the effects of fenugreek as a galactagogue. Five studies were used with 122 participants receiving treatment with fenugreek. Four studies concluded that consumption of fenugreek significantly increased the amount of breast milk produced when compared to placebo ⁽¹⁵⁾.

SPORTS PERFORMANCE

Fenugreek extracts possess promising physiological properties. One systematic review aimed to investigate the effects of fenugreek on muscle performance. Six randomized controlled trials were included in this review, with one trial being conducted on both sexes, and the remaining five being conducted in just males. The authors of this systematic review concluded that fenugreek extracts positively reduced body fat, increased lean body mass, improved muscle strength and endurance. As well as accelerating the rate of glycogen resynthesis during post-exercise recovery ⁽¹⁶⁾.

In another randomized controlled pilot study, 60 healthy male participants were randomized to receive either one capsule of 300mg of fenugreek twice daily, or matching placebo. The subjects participated in a 4-day per week resistance training programme for 8 weeks. This was to evaluate the efficacy of fenugreek on physiological parameters in healthy male subjects. The results concluded that fenugreek supplementation showed promising anabolic and androgenic effects in male subjects participating in a resistance training programme ⁽¹⁷⁾.

METABOLIC SYNDROME

Metabolic syndrome is a group of health conditions which can lead to the increased risk of heart disease and related problems. A systematic review and dose-response meta-analysis of randomized clinical trials investigated the effects of fenugreek supplementation on the components of metabolic syndrome. This involved 29 eligible randomized controlled trials in this meta-analysis with dosages ranging from 25mg to 6g/day and a duration which ranged from 2 to 144 weeks. The results showed that fenugreek supplementation had a significant effect on decreasing systolic blood pressure, as well as improving HDL cholesterol levels, triglycerides, and fasting plasma glucose levels ⁽¹⁸⁾.

This confirmed findings of a previous systematic review and meta-analysis, which investigated the effects of fenugreek on cardiometabolic risk factors in adults. This study found that fenugreek can reduce fasting blood sugar levels and can be helpful for reduction in total cholesterol and low-density lipoprotein cholesterol levels ⁽¹⁹⁾.

ALZHEIMER'S DISEASE

In a randomized controlled trial, the effect of fenugreek seed extract on memory, depression, quality of life and other physiological parameters in Alzheimer's Disease (AD) patients was investigated. This involved 82 AD patients with mild to moderate memory deficit. The patients were administered fenugreek seed extract, which was equivalent to 500mg, for 4 months or placebo. Memory, depression, quality of life, and blood pressure levels were all measured, along with total antioxidant capacity. The results demonstrated positive effects for AD patients, with improvements in memory, quality of life, blood pressure and selective oxidative indices levels ⁽²⁰⁾.

A review investigated the pharmacological attributes of fenugreek with special reference to Alzheimer Disease (AD). The review highlighted the studies and clinical trials which were performed to show the protective effect of fenugreek for neurodegenerative diseases. The authors concluded that fenugreek improved cognitive deficits

and provides neuroprotection against amyloid-beta-induced mitochondria dysfunction. In addition to significantly improving the pathological symptoms of neurodegenerative disease, especially in AD (21).

POLYCYSTIC OVARY SYNDROME (PCOS)

Polycystic ovary syndrome (PCOS) can cause a number of unpleasant symptoms such as infertility, cysts and miscarriages. In a randomized, double-blind, placebo-controlled study the effect of fenugreek seed extract was investigated in women with PCOS. The efficacy of the supplement was compared to placebo and measured the number of cysts, ovarian volume, hirsutism, and other health parameters. The fenugreek extract supplement which was 2 capsules of 500mg/day was shown to significantly reduce the number of cysts, ovarian volume, hirsutism levels and normalised the menstrual cycle in treated subjects over a 90-day period. In addition to this, luteinizing hormone, thyroid stimulation hormone and cholesterol levels all significantly reduced compared to placebo. So, it was concluded that fenugreek seed extract was a safe and natural treatment for alleviating PCOS symptoms (22).

Another similar study of 107 female volunteers with PCOS, investigated the efficacy of fenugreek seed extract in the volunteer patients. This involved the women being given a 1g/day supplement over a period of twelve weeks. The results were clear in that fenugreek induced a >40% reduction in mean cyst size, as well as improving liver function significantly and the severity of insulin resistance and dyslipidaemia (23).

MENOPAUSE

In a randomized, double-blind, placebo-controlled study the efficacy of a fenugreek seed extract supplement on reducing menopausal symptoms was evaluated. This involved 115 women aged 40 to 65 years, of which 59 were allocated to receive 600mg/day of fenugreek seed extract for 12 weeks. With the other 56 participants administered placebo. Outcome measures included Menopause-Specific Quality of Life Questionnaire (MENQOL), frequency of hot flushes and night sweats. The results showed that there was a significant reduction in menopausal symptoms in the active group compared to placebo. This was shown by total MENQOL score as well as vasomotor outcomes correlated with hot flushes, the active group reporting significantly less daytime hot flushes and night sweats at 12 weeks of supplementation (24).

These conclusions were also found in a previous randomized, double-blind, placebo-controlled study, which investigated the effect of 90-day fenugreek seed extract supplementation at a dose of 1000mg/day. This included 88 women, who suffered from moderate or severe postmenopausal symptoms and poor quality of life, being divided into two equal groups receiving either placebo or fenugreek seed extract. Quality of life and postmenopausal discomforts improvements were seen in the fenugreek active group compared to baseline and placebo. In addition to a reduction in hot flushes from a baseline of 3 to 5 times a day to one to two times a day at the 90-day point (25).

DYSMENORRHEA

Dysmenorrhea is a condition which affects women during their menstrual cycle and is classed as painful menstrual period cramps. A systematic review and meta-analysis investigated the effect of fenugreek on the severity of dysmenorrhea. This review included 4 articles, with the results showing that the pain intensity caused by primary dysmenorrhea decreased with fenugreek compared to placebo (26).

Finally, in another randomized controlled trial, two groups were randomly assigned either placebo or 900mg of fenugreek seed three times daily for two consecutive menstrual cycles. This was to investigate the severity of dysmenorrhea symptoms with fenugreek seed extract. The results found that pain severity reduced significantly in both groups, with the fenugreek seed group experiencing a significantly larger pain reduction. Systemic symptoms of dysmenorrhea (fatigue, headache nausea, vomiting, lack energy, syncope) decreased in the fenugreek seed group. Therefore, the data suggested that the prescription of fenugreek seed powder during menstruation can reduce the severity of dysmenorrhea (27).

EFSA Permitted Health Claims

- Fenugreek
 - No EFSA claims made to date.

- Zinc
 - Zinc contributes to normal DNA synthesis
 - Zinc contributes to normal acid-base metabolism
 - Zinc contributes to carbohydrate metabolism
 - Zinc contributes to normal cognitive function
 - Zinc contributes to normal fertility and reproduction
 - Zinc contributes to macronutrient metabolism
 - Zinc contributes to normal metabolism of fatty acids
 - Zinc contributes to normal metabolism of vitamin A
 - Zinc contributes to normal protein synthesis
 - Zinc contributes to the maintenance of normal bones
 - Zinc contributes to the maintenance of normal hair
 - Zinc contributes to the maintenance of normal nails
 - Zinc contributes to the maintenance of normal skin
 - Zinc contributes to the maintenance of normal testosterone levels in the blood
 - Zinc contributes to the maintenance of normal vision
 - Zinc contributes to the normal function of the immune system
 - Zinc contributes to the protection of cells from oxidative stress
 - Zinc has a role in the process of cell division

Ingredients

- One capsule provides:

Ingredient	Weight
Fenugreek extract 50% Saponins	600mg
Zinc Citrate	5mg

Dosage

- Take one to two capsules daily with food. Do not exceed stated dose unless recommended by your healthcare practitioner.

Recommended use:

- Not suitable for children.

Pregnancy and breast-feeding

- Not suitable for use during pregnancy but can be used during breastfeeding.

Advisories

- Not to be used in patients who are allergic to other Fabaceae plants.

Contraindications

- None known.

Drug interactions

- Caution should be taken alongside anticoagulant and antiplatelet medication.

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